4 IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter provides an assessment of the potential environmental impacts that would result from the Proposed Action and No Action Alternative. Chapter 4 is organized similarly to Chapter 3. Subchapters 4.1 to 4.10 address the impacts on specific resources. Subchapter 4.11 addresses cumulative impacts.

4.1 Land Use, Plans, and Coastal Zone Management

4.1.1 Land Use

4.1.1.1 No Action Alternative

Under the No Action Alternative, Defense CEETA would not hire additional personnel and T Block and parking garage would not be constructed. The East Annex, parking lot, and other paved areas would remain as they presently are.

4.1.1.2 Proposed Action

The Proposed Action would result in the displacement of 56,000 sq ft (5,200 sq m) of existing buildings (triple-wide trailers, parking lot, and other paved areas). The construction area is immediately adjacent to the Defense CEETA UTB Building and is within the fenced boundaries of the Defense CEETA complex. The proposed changes would be consistent with current land uses.

The Proposed Action would add 250 personnel to the Fort Belvoir and regional work populations. This represents about a 1.2 percent increase in the Fort Belvoir, and a much smaller increase in the regional, population. This increase is not anticipated to lead to any changes in land use patterns.

4.1.2 Master Plans

4.1.2.1 No Action Alternative

The No Action Alternative would have no impact on master plans.

4.1.2.2 Proposed Action

The Proposed Action would be consistent with the Fort Belvoir Master Plan. The Fort Belvoir Master Plan for the Upper North Post Planning District includes areas designated for recreation, administrative, research and development, and a supply storage area. The Defense CEETA complex is within the area designated for research and development. The proposed placement of the T Block addition is in keeping with the desired character of clusters of high-density development to preserve environmentally-sensitive land and open space within this planning district.

The Proposed Action would not increase the amount of paved surfaces with the area Defense CEETA complex. Thus, the project would not contravene the Fort Belvoir Master Plan goal of covering no more than 20 percent of a lot with pavement and structures. The planning district overall is less than 20 percent developed because of the substantial amount of land set aside for the wildlife corridor, wetlands, and stream valleys.

4.1.3 Coastal Zone Management

4.1.3.1 No Action Alternative

The No Action Alternative would generate no impact that would require a permit from the core Commonwealth of Virginia regulatory programs pertinent to the Coastal Resources Management Program (CRMP). It would have no effect on coastal zone resources.

4.1.3.2 Proposed Action

The introduction of 250 new personnel to the installation and the construction of T Block, parking garage, and associated pavements would be consistent to the maximum extent practicable with the Commonwealth of Virginia's CRMP enforceable policies:

Encroachment on Subaqueous Lands. There would be no impact on subaqueous lands.

Encroachments on Wetlands. There would be no direct impact to wetlands.

Air Pollution Control. An air quality analysis, detailed in Subchapter 4.5 and Appendix A, indicates that emissions from fugitive dust and construction equipment would not exceed regional *de minimis* levels. There would be no significant impact on regional air quality. A Clean Air Act General Conformity Record of Non-Applicability is included in Appendix B. Because heating for the proposed T-Block building would be provided by heated wastewater generated from the cooling towers in the existing power plant, the Proposed Action would not create any new stationary sources of air emissions.

Primary Sand Dune Management Program. No primary sand dunes occur in the proposed construction areas.

Fisheries Management. The proposed action would not have direct effects on finfish and shellfish resources. There would be no increase in stormwater discharged to the South Creek detention basin, and therefore no effect on downstream water quality or fish habitat.

Land Disturbing Activities Needing Erosion and Sediment Control. No Virginia Pollutant Discharge Elimination System (VPDES) permit would be required for this project because construction activities would disturb less than 5 ac (2 ha) of land.

Point Source Pollution Control. The proposed action would discharge wastewater into the Fort Belvoir sewer system, which is connected to the Fairfax County wastewater system, and treated at the Noman J. Cole Jr. Pollution Control Plant.

Control of Septic and Other On-Site Domestic Waste Systems. The proposed action would not include the demolition or installation of septic tanks.

Coastal Lands Management. The proposed action would not affect the potential for development in the coastal zone. Stormwater would be collected and discharged to the existing stormwater systems that were designed using best management practices and that meet Fairfax County requirements for the Chesapeake Bay RMA. The proposed action would not disturb Chesapeake Bay RPAs.

4.2 Socioeconomics

4.2.1 Demographics

4.2.1.1 No Action Alternative

The No Action Alternative would result in no change of personnel and, therefore, would not cause changes in the installation's workforce or resident populations in surrounding communities. It would have no impact on area or regional demographics.

4.2.1.2 Proposed Action

The Proposed Action would bring 250 new military or civilian employees to Fort Belvoir. Although these workers would be new hires, it is likely that most of them would be recruited in the Washington, DC, area and already reside within commuting distance of Fort Belvoir. However, some new employees may be recruited outside the region. Such employees and their

families would then likely relocate close to their new place of work, most likely within the 30-mi (48-km) radius area defined in Subchapter 3.2.1.

According to Census 2000 statistics, the average household size in the United States is 2.59 persons. Thus, if all new 250 employees were recruited from outside the region and relocated to within 30 mi (48 km) of Fort Belvoir, approximately 650 individuals would be added to an area that was home to almost 4.3 million people in 2000. This would represent an increase of just 0.015 percent. Even if all 650 newcomers chose to settle in Fairfax County, the resulting increase in county population relative to 2000 would be 0.06 percent. Since 1) it is likely that most of the 250 jobs would actually be filled by people currently residing within the Fort Belvoir region, and 2) not all new employees that would be recruited outside this region and their families would settle in Fairfax County, actual increases in the resident population of the region or of any of the jurisdictions that comprise it would in fact be very small. Thus, no demographic impacts are anticipated as a result of the proposed action.

4.2.2 Employment and Income

4.2.2.1 No Action Alternative

The No Action Alternative would have no impact on employment levels or average incomes for Fort Belvoir and the surrounding area.

4.2.2.2 Proposed Action

Implementation of the Proposed Action would result in the creation of 250 new positions at Fort Belvoir. In 2001, total non-agricultural employment in Fairfax County was 575,700. Thus, the proposed action would represent a 0.04 percent increase in county jobs. Assuming an average annual salary of $57,000 (US Army Garrison Fort Belvoir, December 2000), these new jobs would account for approximately $14.25 million in direct annual earnings.

4.2.3 Environmental Justice and the Protection of Children

Signed on February 11, 1994, Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs all federal departments and agencies to incorporate environmental justice considerations in achieving their mission. Each federal department or agency is to accomplish this by conducting programs, policies, and activities that substantially affect human health or the environment in a manner that does not exclude communities from participation in, deny communities the benefits of, nor subject communities to discrimination under such actions because of their race, color, or national origin.

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was signed on April 21, 1997. Because the scientific community recognized that children may suffer disproportionately from environmental health and safety risks, each federal agency is directed to identify and assess such risks, and consequently to ensure that its policies, programs, activities, and standards address effects on children. "Environmental health and safety risks" are defined as "risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest." Covered regulatory actions that are affected by this EO are those substantive actions that concern an environmental health risk or safety risk that an agency has reason to believe may disproportionately affect children.

The proposed action has no potential to disproportionately affect minority, low-income, or children populations. As shown in Subchapter 3.2.2, half the population of Accotink Village belongs to a racial or ethnic minority, and, therefore, Accotink Village qualifies as an Environmental Justice community. However, it is located almost a mile from the proposed project area and would not be affected by the proposed action.

4.3 Community Facilities and Services

4.3.1 No Action Alternative

Under the No Action Alternative, there would be no change in demand for existing services.

4.3.2 Proposed Action

Fort Belvoir

The addition of 250 new, predominantly civilian personnel to Fort Belvoir, while a net increase in the number of employees at the installation, would not increase its residential population. Therefore, there would be no adverse impact on the Fort Belvoir Elementary School. Increased use of Fort Belvoir's facilities would be limited to work-related activities (involving, for example, walking trails, ballfields, credit union, gas stations, food services). The small number of any additional military personnel would be likely to make use of the services available to them, such as the Commissary and the Post Exchange, as well as those services available to civilian personnel. Such use is not expected to significantly affect these facilities.

Any military personnel would be assigned to DeWitt Army Community Hospital and its four community-based primary care clinics, with most use at the main DeWitt facility because of its proximity to their place of work. The 60-bed hospital is now operating with an occupancy rate of 50 percent (Wilkinson, February 17, 2000), so increased use would not tax the facility. No

adverse impacts on these services and facilities are anticipated because the number of new military personnel would be so small in relation to the total use of the facilities.

Fairfax County

Most new Defense CEETA personnel are anticipated to come from Fairfax and surrounding counties. It is not anticipated that the new personnel would establish more than a few new households in the region. Even if all 250 personnel were to relocate from outside the region, it is unlikely that these new households would concentrate in any particular area. Thus, any increase in demand for services – such as schools, fire, and rescue – is likely to be very small.

4.4 Transportation and Traffic

Because of late changes in the project schedule, the traffic analysis for this EA was conducted with a 2003 horizon year, even though the new Defense CEETA employees are now expected to move into the new building in 2004. This slight discrepancy does not significantly affect the conclusions of the following analysis since no traffic-generating project is expected to be implemented on Fort Belvoir between these dates.

4.4.1 No Action Alternative

Under the No Action Alternative, Defense CEETA would not build T Block and there would be no increase in the number of employees. No Action Alternative travel patterns were examined for the year 2003, to form a baseline against which the Proposed Action can be evaluated.

4.4.1.1 No Action Alternative Traffic Volumes

Estimates for future traffic volumes under the No Action Alternative include increases in background traffic projected from existing conditions to the year 2003. The existing conditions are based on data collected in March/April 2002, when Beulah Street was closed to all traffic. For the No Action Alternative analysis, the reopening of Beulah Street to DoD-affiliated traffic only, effective in early June 2002, was taken into account by estimating the amount of traffic that was diverted back to Beulah Street after it was reopened. Beulah Street offers an additional access to the North and South Posts to DoD-affiliated traffic.

Also, this analysis includes consideration of the relocation of the Army Materiel Command (AMC) to Fort Belvoir. That relocation would result in the addition by 2003 of 1,350 AMC employees to the 1400 Area of South Post, and the increase in traffic generated by this action should thus be considered as part of the No Action Alternative. The AMC relocation was the subject of the *Environmental Assessment for the Relocation of Army Materiel Command to Fort*

Belvoir, Virginia, published in 2002. Table 4-1 contains a summary of the directional trips generated by AMC for each peak hour. No other new development projects are planned outside Fort Belvoir that would increase background traffic within the period considered here.

Table 4-1

Estimated Trip Generation for AMC

Peak Hour	Inbound	Outbound	Total
AM Peak Hour			
Trip Generation Rate	0.293	0.017	0.310
T Block Trips	396	23	419
PM Peak Hour			
Trip Generation Rate	0.019	0.257	0.276
T Block Trips	26	347	373
Source: TransCore, July 2002.			

No Action Alternative traffic volumes were determined by applying a growth factor of 1.5 percent to the existing "through" traffic volumes and adding the traffic generated by the 1,350 AMC employees that would be relocated to Fort Belvoir by the year 2003. A summary of the No Action traffic volumes is included in Appendix C.

4.4.1.2 No Action Alternative Level of Service

A traffic operational analysis for this alternative was conducted for each of the intersections used to define existing conditions (see Subchapter 3.4). Summaries of 2003 LOS under the No Action Alternative are shown in Table 4-2. The reopening of Beulah Street diverted a significant amount of traffic from the intersection of Fairfax County Parkway and Kingman Road. While, under the No Action Alternative, this intersection would still operate over capacity in the pm peak hour, the V/C ratio would be reduced considerably compared to the existing conditions described in Subchapter 3.4 (with Beulah Street closed). In addition, the Fairfax County Parkway roadway links between Kingman Road and Telegraph Road, and the Telegraph Road links between the Fairfax County Parkway and Beulah Street, would see reductions in traffic volume as vehicles are diverted to Beulah Street through the North Post.

4.4.1.3 Transit Performance Assessment

Given the existing ridership on the three routes operating in the general vicinity of the Defense CEETA site, adequate capacity exists to meet any expected increase in transit demand under the No Action Alternative.

Table 4-2

Levels of Service: No Action Alternative

Signalized Intersections	AM		PM	
	V/C Ratio	Capacity Status	V/C Ratio	Capacity Status
Telegraph Road/Defense CEETA Entrance	0.40	Under Capacity	0.50	Under Capacity
Telegraph Road/Beulah Street	0.66	Under Capacity	0.76	Under Capacity
Telegraph Road/Newington Road	0.56	Under Capacity	0.69	Under Capacity
Telegraph Road/FCP NB Ramps	0.45	Under Capacity	0.56	Under Capacity
Telegraph Road/FCP SB Ramps	0.50	Under Capacity	0.64	Under Capacity
Fairfax County Pkwy/Kingman Road	0.58	Under Capacity	1.09	Over Capacity
Kingman Road/Beulah Street	0.39	Under Capacity	0.53	Under Capacity
Kingman Road/Gunston Road	0.39	Under Capacity	0.29	Under Capacity
Source: TransCore, July 2002.				

4.4.2 Proposed Action

4.4.2.1 Travel Patterns of Defense CEETA Employees

This section defines the likely travel patterns of the new Defense CEETA employees to Fort Belvoir and presents the trip generation information used in determining the impacts of the relocation. To develop trip generation rates for use in the traffic impact analysis, the most likely access corridors for new Defense CEETA employees were identified, based on the place of residence and travel patterns of several of the existing workforce populations on Fort Belvoir, and on MWCOG information. The new Defense CEETA employees are likely to adopt similar residential and commuting patterns. Sources of information used include:

- Zip code database of AMC employees relocating to Fort Belvoir.
- Zip code database of Defense Threat Reduction Agency (DTRA) employees relocating to Fort Belvoir.
- Data on trip origins from the Metropolitan Washington Council of Governments (MWCOG) Air Quality Conformity Model.
- Current trip patterns to the Defense CEETA site.

Table 4-3 summarizes the access corridors anticipated to be used by new Defense CEETA employees. The access corridor most heavily used is expected to be Route 1 from the south, with 35 percent of the DCEETA employees projected to use that facility to access Fort Belvoir. An additional 19 percent are expected to use the Fairfax County Parkway from the northwest, and an equal proportion of employees are projected to use Telegraph Road from the north.

Table 4-3

Access Corridors to Fort Belvoir

Access Corridor	Distribution
US Rt 1 (from South)	35%
US Rt 1 (from North)	12%
Fairfax County Pkwy	19%
Telegraph Road (from North)	19%
Beulah Street (from North)	5%
Newington Road	10%
Total	100%
Source: TransCore, July 2002.	

Traffic counts provided information on the number of trips to and from the site for the main entry and exit periods of the day. It is assumed that the trip generation rates for new Defense CEETA employees (number of trips per employee) would be comparable to the trip generation rate for the current workforce (0.175 total trips per person, including 0.157 inbound and 0.018 trips outbound) during the morning peak hour. Evening peak hour trip generation rates would also be comparable to the existing rates (0.144 total trips per person, including 0.010 trips per person inbound and 0.134 trips per person outbound).

Applying the trip generation rates to the 250 new employees provides the number of trips added to the roadway network in the vicinity of Fort Belvoir by the Proposed Action. The addition of 250 employees to Defense CEETA would generate a total of 45 new trips in the morning peak hour and 37 in the afternoon peak hour. This information is summarized in Table 4-4.

Table 4-4

Estimated Trip Generation for Defense CEETA

Peak Hour	Inbound	Outbound	Total
AM Peak Hour			
Trip Generation Rate	0.157	0.018	0.175
T Block Trips	40	5	45
PM Peak Hour			
Trip Generation Rate	0.010	0.134	0.144
T Block Trips	3	34	37
Source: TransCore, July 2002.			

Defense CEETA employee commuting trips are spread throughout the day, reflecting an agency that operates 24 hours a day, seven days a week. This pattern would apply to new personnel.

4.4.2.2 Proposed Action Traffic Volumes

The Proposed Action traffic volumes were derived from the No Action Alternative's traffic volumes by assigning the trips generated by the 250 Defense CEETA employees to the roadway network based on approach routes and paths to their destinations at Fort Belvoir. A summary of the Proposed Action traffic volumes is included in Appendix C.

4.4.2.3 Proposed Action Levels of Service

A traffic operational analysis was conducted for each of the study intersections. Projected intersection levels of service are summarized in Table 4-5. The Proposed Action would not have an adverse impact on traffic, where an adverse traffic impact is defined as a condition that increases a V/C ratio by more than five percent. As is the case under existing conditions and under the No Action Alternative, the intersection of Fairfax County Parkway and Kingman Road would remain over capacity in the evening peak hour.

Table 4-5

Levels of Service: Proposed Action

Signalized Intersections	AM		PM	
	V/C Ratio	Capacity Status	V/C Ratio	Capacity Status
Telegraph Road/Defense CEETA Entrance	0.41	Under Capacity	0.51	Under Capacity
Telegraph Road/Beulah Street	0.67	Under Capacity	0.76	Under Capacity
Telegraph Road/Newington Road	0.57	Under Capacity	0.70	Under Capacity
Telegraph Road/FCP NB Ramps	0.45	Under Capacity	0.57	Under Capacity
Telegraph Road/FCP SB Ramps	0.51	Under Capacity	0.64	Under Capacity
Fairfax County Pkwy/Kingman Road	0.58	Under Capacity	1.09	Over Capacity
Kingman Road/Beulah Street	0.39	Under Capacity	0.53	Under Capacity
Kingman Road/Gunston Road	0.39	Under Capacity	0.29	Under Capacity
Source: TransCore, July 2002.				

4.4.2.4 Transit Performance Assessment

Under the Proposed Action, approximately 250 new employees would work at the Defense CEETA site by 2003. This level of additional employment, combined with the current level of employment at Defense CEETA, would generate a maximum transit potential of no more than 20 to 25 riders per day from the site.

There is presently no significant transit ridership to and from Defense CEETA, as indicated by the fact that the nearest transit route is located approximately 0.4 mi (0.6 km) from the building entrance. Previous surveys have found that even with direct access to Fort Belvoir facilities, existing transit routes attract no more than a two-percent share of the travel market. The possibility exists that one or more of the three transit routes currently operating in the vicinity of Defense CEETA could be extended or modified to serve the site. However, extensions are unlikely in the near future – the operator of the service (Fairfax Connector) is currently reviewing possible service reductions due to budgetary considerations. The existing routes do have adequate capacity to meet the anticipated demand at Defense CEETA, but the maximum potential of 20 to 25 additional riders is considered too small to justify the added expense of extending service to the site, particularly given the current budget situation.

4.5 Air Quality

The air quality analysis for the Proposed Action and the No Action Alternative includes:

- A microscale CO analysis of potential impacts on local traffic, using the modeling procedures described in Subchapter 3.5.
- A Clean Air Act General Conformity applicability analysis of direct and indirect emission increases that would result from the Proposed Action.

4.5.1 No Action Alternative

Mobile Sources

The results of the microscale air quality analysis for the No Action Alternative (year 2003) indicate that CO levels would be about the same as those predicted under existing conditions (see Table 4-6). The analysis shows no violations of the one-hour CO standard of 35 ppm or the eight-hour standard of 9 ppm.

Stationary Sources

Under the No Action Alternative, air pollutant emissions associated with the Proposed Action would not occur and emissions at Fort Belvoir would remain at current levels. Thus, the No Action Alternative would not affect current air quality conditions.

Table 4-6

Worst-Case CO Levels - No Action Alternative and Proposed Action

Location	One-Hour Concentration (ppm)		Eight-Hour Concentration (ppm)	
	No Action Alternative	Proposed Action	No Action Alternative	Proposed Action
Telegraph and DEFENSE CEETA Entrance	8.8	9.1	5.0	5.2
Telegraph and Beulah Street	10.4	10.5	6.1	6.2

Notes: CO levels include background concentrations of 6.0 ppm (1-hour) and 3.0 ppm (8-hour).
NAAQS CO one-hour standard is 35 ppm; the eight-hour standard is 9 ppm.

4.5.2 Proposed Action

Mobile Sources

The microscale CO modeling indicates that CO levels under the Proposed Action would be slightly higher than under the No Action Alternative. However, the Proposed Action would cause no violations of either the one-hour or the eight-hour CO standard. The predicted worst-case CO concentrations are presented in Table 4-6.

Stationary Sources

Under the current plans, the space heating for the proposed T-Block building would be provided by heated wastewater generated from the cooling towers in the existing power plant. Therefore, no new stationary sources or new air emissions would occur under the Proposed Action.

Construction Activities

Construction activities would cause short-term air quality impacts, as follows:

- Fugitive dust would be generated during construction operations. Adherence to local ordinances as well as the application of water to control dust and periodic street sweeping and/or wetting down of paved roadway surfaces would help prevent fugitive dust from becoming airborne.

- Construction activities would cause emission of VOCs and NO_x, which are precursors of O_3. Such activities would include:

  – Use of construction equipment.
  – Movement of trucks carrying construction materials.
  – Use of paving equipment.
  – Commutes of construction workers.

Clean Air Act Conformity

The following general conformity rule analysis was conducted according to the guidance provided by the USEPA in *Determining Conformity of General Federal Actions to State or Federal Implementation Plans* (November 30, 1993). Under the general conformity rule, reasonably foreseeable emissions associated with all operational and construction activities, both direct and indirect, must be quantified and compared to the annual *de minimis* levels for those pollutants fow which the area is in non-attainment. The general conformity rule analysis is detailed in Appendix A. For a serious ozone nonattainment area such as the Fort Belvoir area, the *de minimis* criterion is 50 tons per year (tpy) (45 metric tpy) for both VOCs and NO_x.

Operational Activity Emissions

The T-Block building is to be used for administrative and computer office activities, and would be heated by wastewater from existing cooling towers. Thus, under the Proposed Action, the operational activities would produce no new emissions.

Construction Activity Emissions

Increased VOC and NO_x emissions from proposed construction activities would result from the following potential activities:

- Use of construction equipment.
- Movement of trucks carrying construction materials.
- Construction workers commutes.

Estimates of construction equipment emissions were based on the estimated hours of use and emission factors for each motorized source. Emission factors for NO_x and VOCs related to heavy-duty diesel equipment were obtained from *Non-road Engine and Vehicle Emission Study* (USEPA, 1991). Emission factors for NO_x and VOCs related to delivery trucks and the vehicles of construction workers were estimated using the USEPA Mobile5b computer model. The equipment and vehicle operation hours are estimated based on Means (2000) and field experience from similar projects. The detailed methodologies used in calculating construction emissions are presented in Appendix A.

Conformity Applicability Determination

Under the general conformity rule, total emissions resulting from proposed federal actions must be compared to the applicable *de minimis* levels on an annual basis. As defined by the general conformity rule, if the emissions of a criteria pollutant (or its precursors) do not exceed the *de minimis* level, the federal action has minimal air quality impact, and the action is determined to conform for the pollutant under study. No further analysis is necessary. Conversely, if the total direct and indirect emissions of a pollutant are above the *de minimis* level, a formal general conformity determination is required for that pollutant.

As shown in Table 4-7, the annual emission values under the Proposed Action would not exceed the *de minimis* criteria of 50 tpy (45 mtpy) of VOCs or NO_x. Therefore, a formal conformity determination is not required and potential air quality impacts would not be significant.

The *Final State Implementation Plan Revision, Phase I Attainment Plan* (MWCOG, 1997) sets forth daily target levels of 362.9 tpd (329 metric tpd) of VOCs and 637.1 tpd (578 metric tpd) of NO_x for the metropolitan Washington ozone nonattainment area (which includes Fairfax County). The increase in annual emissions would not make up ten percent or more of the

available regional emission inventory for VOCs or NO_x and would not be regionally significant. The Record of Non-Applicability is provided in Appendix B.

Table 4-7

Proposed Action - Total Emissions Levels

Activity	Year	Emission Source	Pollutant (tons/year)	
			VOC	NO_X
Construction	2003	Equipment	0.43	4.46
		Motor Vehicles	0.36	1.61
Total Annual Emissions (Year 2003)			***0.79***	***6.07***
Construction	2004	Equipment	0.43	4.46
		Motor Vehicles	0.36	1.61
Total Annual Emissions (Year 2004)			***0.79***	***6.07***
De Minimis Levels			**50**	**50**

4.6 Noise

Human response to changes in noise levels depends on many factors, including the quality of the sound, the magnitude of the change, the time at which the change takes place, whether the noise is continuous or intermittent, and the individual's ability to perceive the changes. Noise levels are typically expressed in decibels (dB). Decibels are a logarithmic expression of sound energy. Frequency weightings have been developed to more closely duplicate the human hearing response. A-weighted decibels, or dBA, are the weighting network most often applied to traffic noise evaluations.

Human ability to perceive changes in noise levels varies widely from person to person, as do responses to perceived changes. However, the average ability of an individual to perceive changes in noise levels is well documented, and is shown in Table 4-8. Generally, a three-dBA or smaller change in noise level would be barely perceptible to most listeners. A five-dBA change would be readily noticeable. A 10-dBA change is normally perceived as a doubling (or

halving) of the noise. These thresholds make it possible to estimate an average individual's probable perception of changes in noise levels.

Table 4-8

Average Ability to Perceive Changes in Noise Levels

Change in Decibels (dBA)	Perception of Sound
2-3	Barely perceptible
5	Readily noticeable
10	A doubling or halving
20	A "dramatic change"
40	Difference between a faintly audible sound and a very loud sound
Source: Federal Highway Administration, June 1995.	

4.6.1 No Action Alternative

Under the No Action Alternative, there would be no change in activities at Fort Belvoir. Noise levels in the project area would remain the same as under existing conditions.

4.6.2 Proposed Action

An increase in traffic noise due to the Proposed Action would be expected in the vicinity of the installation and can be determined based on the proportional increase in traffic (on a logarithmic basis) associated with the project. Thus, a doubling of traffic volumes would result in a three-dBA increase in noise level, which is a barely perceptible increase. Based on the traffic analysis described in Subchapter 4.4, future traffic volumes near the installation during peak-hour conditions would be unlikely to double the volume under the No Action Alternative. Therefore, noise increases from project-related increase in traffic would be barely perceptible and would not be significant.

Impacts on installation noise levels during construction activities associated with the Proposed Action would include noise from construction equipment operating at the site and construction vehicles/delivery vehicles traveling to and from the site. Noise impacts would also vary widely, depending on the phase of construction – demolition, land clearing and excavations, foundation and capping, roadway, and parking lot paving, etc. – and the specific task being undertaken. Noise levels would be greatest during the early stages of construction phase, but these periods

would be of relatively short duration. Overall, the noise generated would be similar to noise generated by other construction projects in the area.

Noise levels at a given receptor location would depend on the type and number of pieces of construction equipment being operated and the receptor's distance from the construction site. In addition, small increases in noise levels along the truck routes would be expected as a result of the operation of delivery trucks and other construction vehicles.

4.7 Infrastructure

The Proposed Action would result in a new, 100,000 gross sq ft (9,290 gross sq m) office/research building at Defense CEETA, which would require additional service from and connections to all utilities. Detailed plans for construction have not yet been developed, but it is anticipated that connections can be made with the existing distribution systems serving the complex.

4.7.1 Potable Water Supply

4.7.1.1 No Action Alternative

Implementation of the No Action Alternative would result in no changes in personnel or infrastructure at the installation, and no changes in demand for potable water.

4.7.1.2 Proposed Action

The addition of 250 personnel at Defense CEETA would generate an increase in demand for potable water. At an average water usage per person of 80 gallons per day (gpd) (302.8 liters per day [lpd]) adjusted to 30 gpd (114 lpd) for daytime business hours (ICMA, 1988), the net increase in personnel would increase daytime demand by 7,500 gpd (28,391 lpd). This amount can be amply provided by the 10-in (25-cm) line that loops around the Main Building. The current water distribution system is sufficient to meet domestic and fire water requirements for the new building.

4.7.2 Wastewater

4.7.2.1 No Action Alternative

The No Action Alternative would result in no changes in personnel or infrastructure at the installation and, therefore, no changes in the amount of wastewater generated.

4.7.2.2 Proposed Action

Nationally, the amount of wastewater generated per person is about 80 percent of the amount of potable water consumed (ICMA, 1988). Thus, the net increment of up to 250 personnel would generate about 6,000 gpd (22,713 lpd) of wastewater during business hours that would be added to the Fort Belvoir system.

Construction of new sewer connection to the existing system are already being evaluated as part of a separate project on Fort Belvoir. The existing wastewater treatment system has sufficient capacity to handle the 6,000 gpd (22,713 lpd) increase in wastewater that the T Block would generate.

4.7.3 Electricity

4.7.3.1 No Action Alternative

The No Action Alternative would result in no new construction and, thus, no increase in demand for electric service.

4.7.3.2 Proposed Action

Electric service would be provided to the proposed T Block from the Beulah or Williams Woods substations through two 4.16 kV feeders. Existing underground duct banks would be used to route the feeders to the T Block's unit substations. Within the T Block, power would be distributed at 480 V to electrical equipment rooms on each level. Both the Beulah and Williams Woods substations have sufficient capacity to serve the proposed T Block

4.7.4 Heating

4.7.4.1 No Action Alternative

The No Action Alternative would result in no new construction and, thus, no increase in demand for heating and cooling.

4.7.4.2 Proposed Action

The Proposed Action would require connecting the proposed 100,000 gross sq ft (9,290 gross sq m) T Block addition to the Defense CEETA system. There is sufficient capacity within the system to meet the heating and cooling needs of both the existing buildings and the proposed T Block.

4.7.5 Solid Waste

4.7.5.1 No Action Alternative

The No Action Alternative would cause no change in the number of employees stationed at Fort Belvoir and, therefore, no change in the rate at which solid waste is generated.

4.7.5.2 Proposed Action

The addition of 250 new employees would increase the employee population and, therefore, the volume of solid waste generated at Fort Belvoir by about 1.2 percent. This additional amount would have to be collected and hauled to a licensed landfill by Waste Management Inc., under contract with Defense CEETA. The increase would be a small percentage of the employee-produced volume of solid waste (exclusive of the amount produced by families residing on the installation).

4.7.6 Stormwater

4.7.6.1 No Action Alternative

The No Action Alternative would cause no change in paved or other impermeable surfaces and, therefore, no change in the amount of stormwater runoff at Fort Belvoir.

4.7.6.2 Proposed Action

The proposed T Block and parking structure would be constructed on an area that is already paved or occupied by hard surfaces (two parking areas and the East Annex structures). Thus, there would be no increase in the amount of impermeable surface and no increase in the amount of stormwater runoff that would be generated.

Construction of the T Block and parking structure would involve land-disturbing activities, and erosion and sedimentation control plans would be developed for the site. However, the proposed construction at Defense CEETA would result in less than five ac (two ha) of land being disturbed. Thus, a VPDES permit is not required for this particular project.

Stormwater at the proposed T Block site is already serviced by a drainage system that discharges to a detention pond on South Creek. Any existing storm drains lying under the footprint of the proposed building would have to be relocated.

Short-term best management practices would be used during construction to minimize erosion and sedimentation. These practices would include the construction of silt fences, temporary sedimentation basins, and the like.

4.8 Cultural Resources

4.8.1 No Action Alternative

Under the No Action Alternative, there would be no change in existing conditions and thus no impact on cultural resources.

4.8.2 Proposed Action

There are no cultural resources potentially eligible for inclusion in the National Register of Historic Places on or near the project site. Therefore, the Proposed Action would have no impact on such resources.

4.9 Natural Resources

4.9.1 Topography and Geology

4.9.1.1 No Action Alternative

The No Action Alternative would have no impact on the topography or geology of the installation.

4.9.1.2 Proposed Action

The construction of T Block would require very little regrading and leveling. The proposed construction site is already a flat parking area. The construction of the new parking structure would require some leveling, as the current parking area now occupying the site slopes downward to the south and east. Overall, the Proposed Action would not significantly alter the topography or geology of the area.

4.9.2 Floodplains

4.9.2.1 No Action Alternative

The No Action Alternative would have no impact on floodplains.

4.9.2.2 Proposed Action

No 100-year floodplain occurs at the Defense CEETA complex or near the proposed construction site.

4.9.3 Soils

4.9.3.1 No Action Alternative

The No Action Alternative would have no impact on soils.

4.9.3.2 Proposed Action

Implementation of the Proposed Action would disturb some Urban Build-up, Beltsville silt loam, and Dumfries sandy loam. Excavations for the foundations of the new building would reach down to about 30 ft (9.1 m) below the surface. Excavations for the new parking garage would extend somewhat less than 30 ft (9.1 m) below the surface. No bedrock underlies the site at this depth, so no blasting would be required.

Short-term best management practices, including silt fences and temporary sedimentation basins, would be used during construction to minimize erosion and sedimentation of exposed soils.

4.9.4 Groundwater

4.9.4.1 No Action Alternative

The No Action Alternative would have no impact on groundwater resources.

4.9.4.2 Proposed Action

The Proposed Action would have little or no impact on groundwater resources. It would not require any withdrawal of groundwater since water for the site is supplied by the Fairfax County Water Authority system.

The Proposed Action would not increase the amount of runoff generated compared to existing conditions.

4.9.5 Surface Water

4.9.5.1 No Action Alternative

The No Action Alternative would have no impact on surface water resources.

4.9.5.2 Proposed Action

Implementation of the Proposed Action would not increase the amount of impermeable surface at the site, and thus would have no impact on stormwater runoff and the streams into which runoff eventually drains. Short-term best management practices would be used during construction to control erosion and subsequent downstream sedimentation.

4.9.6 Vegetation

4.9.6.1 No Action Alternative

The No Action Alternative would have no impact on vegetation.

4.9.6.2 Proposed Action

The Proposed Action would occur in an area virtually devoid of vegetation. Thus, it would have no impact on vegetation.

4.9.7 Wetlands and Chesapeake Bay Preservations Areas

4.9.7.1 No Action Alternative

The No action Alternative would have no impact on wetlands and Chesapeake Bay Preservation Areas.

4.9.7.2 Proposed Action

Since no wetlands or RPAs occur at or near the site of the Proposed Action, there would be no direct impact on either. Use of best management practices would minimize the impact of runoff and potential erosion and sedimentation on nearby RPAs and wetlands.

4.9.8 Wildlife

4.9.8.1 No Action Alternative

The No Action Alternative would have no impact on wildlife at the Defense CEETA installation.

4.9.8.2 Proposed Action

Only animal species highly tolerant of human presence and activity are likely to be found near the Proposed Action site. While such animals currently living near the site would probably be temporarily displaced by construction-related activities, they would likely return to general vicinity after completion of the work.

4.9.9 Threatened and Endangered Species

4.9.9.1 No Action Alternative

The No Action Alternative would have no impact on any threatened or endangered species

4.9.9.2 Proposed Action

No threatened or endangered species are known to occur at the sites of the proposed T Block or new parking garage. Use of best management practices would prevent significant impacts on nearby streams and other potential habitats for threatened or endangered species. Therefore, the Proposed Action would have no significant impact on any such species.

4.10 Hazardous Substances

4.10.1 No Action Alternative

The No Action Alternative would have no impact on the production, use, or storage of hazardous substances at Fort Belvoir.

4.10.2 Proposed Action

Implementation of the Proposed Action would not result in an increase in the use of hazardous materials or generation of hazardous wastes at Fort Belvoir.

4.11 Cumulative Impacts

Cumulative impacts have been defined by the CEQ in 40 CFR 1508.7 as:

> *Impacts on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.*

The CEQ regulations also state that the cumulative impacts addressed should not be limited to those from actual proposals, but must include impacts from other actions being contemplated or that are reasonably foreseeable. The Defense CEETA Master Plan allows for additional building expansion at the Defense CEETA complex, such as the potential expansion of T Block to a full, 290,000-sq ft (26,941-sq m) build-out. The Master Plan provides a roadmap for how expansion would occur – it is not a proposal that such expansion will definitely occur or will be needed.

The CEQ regulations further require that NEPA environmental analyses address connected, cumulative, and similar actions in the same document (40 CFR 1508.25). This requirement prohibits segmentation of a project into smaller components to avoid required environmental analysis. As indicated, while Defense CEETA may opt for further expansions in the future as its mission changes and the need for additional facilities arises, the T Block expansion is not dependent on such future actions, and is not a "segment" of the larger project.

There are a number of projects being planned for implementation at Fort Belvoir that, considered together with the proposed action, could have the potential to negatively affect the transportation system, air quality, stormwater runoff, and water quality on and in the vicinity of the post. Each of the proposed projects individually may not introduce severe adverse impacts, but taken together, the projects have the potential to do so, particularly if mitigation measures do not consider all the proposals together.

Even before the terrorist attack on September 11, 2001, Fort Belvoir was conducting access control exercises to determine how best to control vehicle access through its gates. Following the 9/11 attack, all roads through the post other than the Fairfax County Parkway, US Route 1, and Backlick Road were closed to public access. Beulah Street at Telegraph Road was reopened to DoD-registered vehicles on June 3, 2002. Personnel from both the Virginia Department of Transportation (VDOT) and Fairfax County are participating in a working group reviewing access control issues on Fort Belvoir's roads and at the gates. When long-term decisions on access are made, they will have an effect on the traffic patterns in and around the post.

Four projects are well-articulated with planning and design in advanced stages. Environmental documentation has been or is being prepared for them that will address the cumulative effects of the proposed action in this EA – including traffic, air quality, and natural resource impacts –

combined with the impacts of each of the other projects. The four projects for which implementation is probable are:

- **Relocation of AMC to Fort Belvoir**. A May 2001 environmental assessment (EA), *Environmental Assessment, Relocation of Army Materiel Command and Co-Located Activities to Fort Belvoir, Virginia* (US Army Garrison Fort Belvoir, May 2001) evaluated the proposed relocation of approximately 1,600 Headquarters AMC and co-located activities personnel from the leased facility in Alexandria to facilities on Fort Belvoir. The relocation was to be implemented in three phases. Since the initiation of Phase 1 of the relocation, and in light of heightened security concerns in the wake of the September 11th terrorist attacks, AMC has revised the latter part of the original relocation plan. Now, all Headquarters AMC staff and co-located activities personnel that were to move during Phase 2 and Phase 3 are planned to move onto Fort Belvoir in 2002 - 2003 into temporary modular buildings in the 1400 Area, near the South Post site. Headquarters AMC personnel would occupy these temporary facilities for approximately five to ten years until a location is found where they could be accommodated permanently. A supplemental EA to the May 2001 document was published in May 2002.

- **Fort Belvoir Infrastructure Improvements** – Fort Belvoir proposes to build new infrastructure that would comprise remote fuel oil and gasoline delivery, storage and distribution facilities, remote water storage and distribution facilities, and an underground electrical duct bank. to improve force protection for critical facility operations in the northern part of the installation. A separate EA is currently being prepared for this proposal.

- **DeWitt Hospital Replacement** – Fort Belvoir is proposing to build a new healthcare facility to replace the existing DeWitt Hospital. The new hospital would include a 415,605 –sq-ft (38,610-sq-m) main building, an ambulance shelter, a separate central energy plant, and parking for 885 vehicles. It would be located on the North Post, on a site adjacent to the Post Exchange and Commissary and bounded by John J. Kingman, Woodlawn, and Gunston Roads. The new facility would accommodate the same number of patients with the same amount of staff as the existing one. Construction would begin in 2004 and be completed by January 2007. An EA for this proposal was published in July 2002.

- **New North Post Chapel** – This new structure will be approximately 20,000 sq ft (1,858 sq m), with a 600-seat capacity. It will be built on a 6-ac (2.4-ha) site south of Woodlawn Methodist Cemetery and north and east of the Abbot and Franklin roads intersection. Award of the contract is scheduled for September 1, 2002. Construction is anticipated to take place over 18 months.

Eight other major projects are in earlier stages of conceptualization and planning, and their eventual implementation may or may not occur, or later plans may evolve to encompass different elements:

- **Army Museum** –A proposed Museum of the US Army is planned for the post that would commemorate the Army's history and exploits. It likely would be located in the 1200 area near the southeast corner of US Route 1 and Belvoir Road, on an approximately 50-ac (20-ha) site. It is anticipated that the museum would received up to a million visitors a year.

- **Tompkins Basin Recreation Area** – A master plan has recently been developed and an environmental assessment of the plan is in process for this proposal to build recreational facilities for military use in the Gunston Cove/Tompkins Basin area, southwest of the 200 Area at the end of Warren Road on Accotink Bay. Proposed are tent and recreational vehicle sites, rental cabins, a lodge, and a 150-room hotel with conference center and restaurant.

- **Widening of US Rt. 1** – The Virginia Department of Transportation (VDOT) is considering widening US Route 1 through Fort Belvoir in the future. This action would require outgrants of land to VDOT by Fort Belvoir and would affect traffic levels near the post.

- **Building for US Army Intelligence –** The US Army Intelligence Command is planning to build a new office building and parking structure near their existing headquarters building east of Beulah Road and south of Kingman Road to accommodate about 800 personnel.

- **Privatization of Post Housing –** Alternative plans are being developed to upgrade post housing by turning over the housing to a developer who would renovate housing or demolish older units and rebuild new ones in their place.

- **Road Improvements Evaluated in the North Post Transportation Study** – As part of the post's on-going process to evaluate options for increasing force security, this study identified transportation alternatives for the North Post to improve security. Examined were north-south roadway alternatives to replace existing Beulah Street and Woodlawn Road, the potential to completely close the North Post to off-site traffic, and improvements to local off-site roads to accommodate traffic redirected around North Post. The impacts of closing old roads and locating new ones would be evaluated in further environmental documentation if any of the plans proposed in the North Post Transportation Study are pursued.

- **Administrative Park Site Evaluation Report** – In this study, completed in May 2000, several sites were investigated for their potential to accommodate an office park with several million square feet of office space. The sites investigated were located in the EPG, on North Post, and the southwest area of the post south of US Route 1 and west of Pohick Road. No decision has been reached about a preferred site or even whether the proposal will go forward into the next phase of study.

- **Renovation of Dogue Creek Marina** – This proposed project would involve dredging Dogue Creek and replacing all marina facilities.

4.12 Unavoidable Adverse Impacts

The Proposed Action would lead to short- and long-term local increases in air emissions and noise, both during construction and operation of the new facility. It would contribute slightly to traffic congestion in the vicinity of Fort Belvoir. Because of the small number of people to be relocated, and the size of the new facilities to be constructed, none of these impacts would be significant.

4.13 Relationship between Local Short-term Uses of the Environment and the Enhancement of Long-term Productivity

Implementation of the Proposed Action would have long-term benefits for Defense CEETA, by allowing it to hire the additional personnel needed to carry out its mission. The presence on Fort Belvoir of 250 additional personnel would result in a slightly more intensive use of existing resources.

4.14 Irreversible and Irretrievable Commitments of Resources

Modest amounts of money and man hours would be expended to plan and carry out the proposed relocation as well as to plan for, design, and build the proposed facilities.

4.15 Conclusion

The Proposed Action, as described and assessed in this document, is not expected to have a significant, long-term, adverse impact on the environment, nor it is expected to create environmentally-based controversy. Therefore, an environmental impact statement will not be prepared.